

- 27 -

## Claims:

1. Powdered, crosslinked polymer compositions for absorbing aqueous or serous fluids, as well as blood, containing:
- 55 - 99.9 wt.-% of at least one polymerized, ethylenically unsaturated, polymerizable monomer which contains acid groups neutralized to at least 25 mole-%,
  - 0 - 40 wt.-% of polymerized, unsaturated monomers copolymerizable with a),
  - 0.01 - 5.0 wt.-%, preferably 0.1 - 2.0 wt.-% of one or more crosslinking agents,
  - 0 - 30 wt.-% of a water-soluble polymer,
- the weight amounts a) through d) being based on anhydrous polymer composition, and the sum of these components always being 100 wt.-%, which compositions can be obtained by continuous polymerization wherein at least one parameter biasing the polymerization is varied according to a recurring pattern.
2. The polymer compositions according to claim 1, characterized in that the pattern is an oscillation about a mean value which can be selected at random.
3. The polymer compositions according to claim 2, characterized in that the oscillation is harmonic or anharmonic and preferably undamped.
4. The polymer compositions according to any of claims 1 to 3, characterized by varying at least one of the following parameters:
- the concentration of the crosslinking agent(s),

- 28 -

- the amount of catalyst,
- the amount of molecular weight modifier,
- the pH value of the monomer solution, and/or
- the composition of the monomer solution.

5. The polymer compositions according to any of claims 1 to 4, characterized in that the polymerization is effected on a moving support.
6. The polymer compositions according to any of claims 1 to 5, characterized in that co- or terpolymer compositions are concerned.
7. The polymer compositions according to any of claims 1 to 6, characterized in that the monomers containing acid groups are acrylic acid, methacrylic acid and/or 2-acrylamido-2-methylpropanesulfonic acid.
8. The polymer compositions according to any of claims 1 to 7, characterized in that the monomers containing acid groups are neutralized to at least 50 mole-%.
9. The polymer compositions according to any of claims 1 to 8, characterized in that the only monomer containing acid groups is acrylic acid neutralized to 50-80 mole-%.
10. The polymer compositions according to any of claims 1 to 9, characterized in that water-soluble polymers according to d) are employed at concentrations of 1-5 wt.-%.
11. The polymer compositions according to any of claims 1 to 10, characterized in that the water-soluble polymers are starch and/or polyvinyl alcohol.

- 29 -

Sub A2 12. The polymer compositions according to any of claims 1 to 11, characterized in that the compositions are mixed with 0.05 - 3 wt.-% of a compound capable of reacting with at least two carboxyl groups and heated to 150-250°C, thereby undergoing surface crosslinking.

13. A process for the continuous production of powdered, crosslinked polymer compositions absorbing aqueous or serous fluids, as well as blood, containing:

- a) 55 - 99.9 wt.-% of at least one polymerized, ethylenically unsaturated, polymerizable monomer which contains acid groups neutralized to at least 25 mole-%,
  - b) 0 - 40 wt.-% of polymerized, unsaturated monomers copolymerizable with a),
  - c) 0.01 - 5.0 wt.-%, preferably 0.1 - 2.0 wt.-% of one or more crosslinking agents,
  - d) 0 - 30 wt.-% of a water-soluble polymer,
- the weight amounts a) through d) being based on anhydrous polymer composition, and the sum of these components always being 100 wt.-%, the monomer solution being polymerized to form a gel, said gel being dried and crushed, characterized in that at least one parameter biasing the polymerization is varied according to a recurring pattern.

14. The process according to claim 13, characterized in that the pattern is an oscillation about a mean value which can be selected at random.

Sub B4 15. The process according to claim 14, characterized in that the oscillation is harmonic or anharmonic and preferably undamped.

- 30 -

16. The process according to any of claims 13 to 15, characterized by varying at least one of the following parameters:
- the concentration of the crosslinking agent(s),
  - the amount of catalyst,
  - the amount of molecular weight modifier,
  - the pH value of the monomer solution, and/or
  - the composition of the monomer solution.
17. The process according to any of claims 13 to 16, characterized in that the polymerization is effected on a moving support.
18. The process according to any of claims 13 to 17, characterized in that the polymer composition is powdered subsequent to drying.
19. The process according to claim 18, characterized in that the powdered polymer product is mixed with 0.05 - 3 wt.-% of a compound capable of reacting with at least two carboxyl groups and heated to 150-250°C, thereby undergoing surface crosslinking.
20. Use of the polymer composition according to any of claims 1 to 12 as an absorbent for water and aqueous liquids.
21. Use of the polymer composition according to any of claims 1 to 12 as an absorbent in constructions used to absorb body fluids.
22. Use of the polymer composition according to any of claims 1 to 12 as a component in electroconductive or light-conducting cables which absorbs water and aqueous liquids, as a component in packaging materials, as soil improver, and in plant breeding.

- 31 -

23. Use of the polymer composition according to any of claims 1 to 12 as an absorbent for water and aqueous liquids in preferably foamed sheet materials.
24. Use of the polymer composition according to any of claims 1 to 12 as a vehicle for fertilizers or other active ingredients released over a prolonged period of time.